

REMARKS

Upon entry of this paper, no claims have been amended, no claims have been canceled, and no claims have been added as new claims. Thus, claims 1-20 are presently pending in this application. No new matter has been added.

Drawing Objections

FIG. 1 was objected to as failing to include reference numbers 10, 30, and 34. Applicant has provided herewith a marked-up copy of FIG. 1 with reference numbers 10, 30, and 34 added in red. Applicant respectfully submits that the items described by reference numbers 10, 30, and 34 are adequately described in the specification in an enabling manner, such that no new matter has been added.

As such, Applicant respectfully requests withdrawal of this objection.

Summary of Invention in Pending Application

Prior to discussing the substantive rejections below, applicant wishes to provide a brief summary of some of the features relating to what he regards as his invention as claimed in the pending application. This Summary is not intended to convey all of the inventive aspects of the present invention. Instead, this Summary is intended to merely point out some of the features that have been identified as relevant to the rejections stated in the Office Action.

The present invention is directed toward an ion implantation system that employs an ion source for generating a plasma, and a probe assembly for detecting the ions at a local point of the plasma. The probe assembly includes a probe body and a focusing device or element for extracting the ion from the plasma, and a filter for filtering ions

extracted from the plasma. As used herein, the term ion is intended to include any suitable ion and ion species created within the plasma chamber of an ion source.

Claim Rejections under 35 U.S.C. §102

Claims 1-5, 8, 9-15, and 17-19 were rejected under 35 U.S.C. §102 as being anticipated by US Patent No. 5,113,072 to Yamaguchi et al. (Yamaguchi '072). This anticipatory rejection is respectfully traversed in view of the following comments.

Summary of Yamaguchi '072

Yamaguchi '072 is directed to an apparatus for forming a device having a fine structure, the apparatus including a high intensity ion source. The apparatus can be used to form fine grooves and/or a fine film, by supplying a reactive gas to the surface to be etched or coated while irradiating a focused ion beam on the surface. A laser or electron beam can be irradiated on substantially the same axis as that of the focused ion beam, whereby defects arising due to ion beam processing can be repaired. The apparatus can further include ion beam current detection and measurement structure to determine when a predetermined thickness of coating or depth of etching is achieved. The apparatus can include multiple chambers sequentially holding the surface treated, and can include a scanning electron microscope for scanning the surface being coated or etched.

Claims 1-5, 8, 9-11

Applicant respectfully submits that the structure of Yamaguchi '072 is unrelated to the claimed invention. The claimed invention includes "an ion source having a plasma chamber sized and dimensioned for generating a plasma having an ion present therein" (see claim 1), and places the "probe assembly coupled to the ion source for detecting said ions of said plasma" (see claim 1). In other words, the probe assembly is "a probe device or element that extends within the plasma chamber of the ion source through an

appropriate aperture in a wall of the source, and extracts ions therefrom.” Specification, page 3, lines 30-33.

Contrarily, the device in Yamaguchi ‘072 is a device for forming a device having a fine structure. The apparatus can include an ion beam current detection and measurement structure to determine when a pre-determined thickness of coating or depth of etching is achieved. However, the detection and measurement in Yamaguchi ‘072 occurs external to the ion source and plasma chamber as discussed below. This device can make use of the claimed invention, but is by no means equivalent, and cannot anticipate the claimed invention.

More specifically, Applicant respectfully directs the Examiner’s attention to FIG. 1 of the pending application. In this figure, reference number 13 refers to an arrow indicating an ion beam being extracted from the ion source 12 and plasma chamber 14. The ion beam 13 in Yamaguchi is extracted from the very top portion of the vacuum chamber 1201, which is not labeled, but surrounds the filament 1203. As such, if utilized in Yamaguchi ‘072, the device as claimed would be positioned in the top portion of the Yamaguchi device. The remaining components of Yamaguchi ‘072 simply modify and focus the extracted ion beam, *after it has already left the plasma chamber*, in preparation for cutting. As such, all of these components are external to the plasma chamber, which is different from the vacuum chamber 1201.

Applicant would like to again stress that the probe assembly of the present claimed invention is disposed *within* the plasma chamber where the ion source is located, not external to the plasma chamber. In further confirmation of the Applicant’s interpretation of Yamaguchi ‘072, the ion source is labeled as ion source 1908 in Yamaguchi ‘072 (top of column 10). With the ion source 1908 positioned as indicated, the plasma chamber must be the small unlabeled enclosure around the ion source 1908. As such, there are no other components, or probes, located in the space around the ion source 1908, thus Yamaguchi ‘072 cannot anticipate the claimed invention.

In addition, the only probe discussed in Yamaguchi '072 is charged particle detector 1221, which is external and substantially removed from the plasma chamber and ion source 1908. As such, this charged particle detector 1221 cannot anticipate the claimed invention.

Applicant respectfully requests the reconsideration and withdrawal of this rejection.

Claims 12-15 and 17-19

Claim 12 is directed to a "probe assembly suitable for use with an ion source for detecting an ion in a plasma within a plasma chamber of the ion source", and claim 17 is directed to a "method for detecting an ion within a plasma generated within a plasma chamber of an ion source". Both independent claims, and all claims depending therefrom, require that the probe detect ions directly from the ion source and surrounding plasma chamber, similar to claim 1. As such, the above remarks apply to the assertion of anticipation by Yamaguchi '072. In short, Yamaguchi '072 does not disclose or teach a probe assembly for use in detecting an ion in a plasma within a plasma chamber holding an ion source.

Therefore, Applicant respectfully requests reconsideration and withdrawal of this rejection.

To constitute an anticipation under 35 U.S.C. §102, all the claimed elements must be found in exactly the same situation and united in the same way to perform the identical function in a single unit of the prior art. That is, anticipation can only be established by a single prior art reference teaching each and every element of the claimed invention.

In light of the above comments, applicant respectfully submits that the independent claims of the present invention are not anticipated by, and are therefore in condition for allowance over, the cited document. In addition, all claims depending from the independent claims are allowable based on their dependency upon an allowable claim, in addition to their own claim characteristics.

Claim Rejections under 35 U.S.C. §103

Claim 16

Claim 16 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Yamaguchi '072. This rejection is respectfully, but most strenuously traversed in view of the following comments.

Applicant respectfully submits that there is no suggestion or motivation, either in the prior art or in the knowledge generally available to one of ordinary skill in the art, to modify the reference in the manner suggested.

In addition, even if the choice of an EXB filter were suggested, the resulting structure of Yamaguchi '072 does not teach or suggest all elements of the claimed invention, as detailed in the above §102 remarks. Without all elements taught or suggested, there can be no obviousness rejection.

Applicant therefore respectfully requests the reconsideration and withdrawal of this rejection.

Claim 20

Claim 20 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Yamaguchi '072 in view of US Patent No. 6,208,711 to Rand (Rand '711). This

rejection is respectfully, but most strenuously traversed in view of the following comments.

As previously stated, Yamaguchi '072 fails to teach or suggest all elements of claim 17, including the lack of disclosure teaching a probe inside the plasma chamber with the ion source. Rand '711 does not correct this defect. As such, the combination of Rand '711 with Yamaguchi '072 fails to teach or suggest all claimed elements. Absent such a teaching, there can be no obviousness rejection.

Applicant respectfully requests the reconsideration and withdrawal of this rejection.

Claims 6 and 7

Claims 6 and 7 was rejected under 35 U.S.C. §103 as allegedly being unpatentable over Yamaguchi '072 in view of US Patent No. 4,789,787 to Parker (Parker '787). This rejection is respectfully, but most strenuously traversed in view of the following comments.

As previously stated, Yamaguchi '072 fails to teach or suggest all elements of claim 17, including the lack of disclosure teaching a probe inside the plasma chamber with the ion source. Parker '787 does not correct this defect, but rather is only directed to a filter type that can be used in conjunction with the claimed probe. As such, the combination of Parker '787 with Yamaguchi '072 fails to teach or suggest all claimed elements. Absent such a teaching, there can be no obviousness rejection.

Applicant respectfully requests the reconsideration and withdrawal of this rejection.

Applicant respectfully submits that unless a *prima facie* case of unpatentability with respect to known facts is established, applicant is not obliged to proffer any evidence of nonobviousness. To establish a *prima facie* case there must be some suggestion or motivation, either in the prior art or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine multiple reference teachings. There must then be a reasonable expectation of success. Finally, the prior art reference or references (when combined) must teach or suggest all the claimed limitations.

Additional References

Applicant agrees with the examiner that the remaining documents cited in the official action are less relevant than those applied by the examiner. Applicant is therefore not providing any further comments concerning the same at this time.

CONCLUSION

In view of the foregoing, it is respectfully submitted that this application is now in condition for allowance. Applicant courteously solicits allowance of the claims in the form of a Notice of Allowance. Should there be any outstanding issues of patentability following the entry of this response, a telephone interview is respectfully requested to resolve such issues.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. §1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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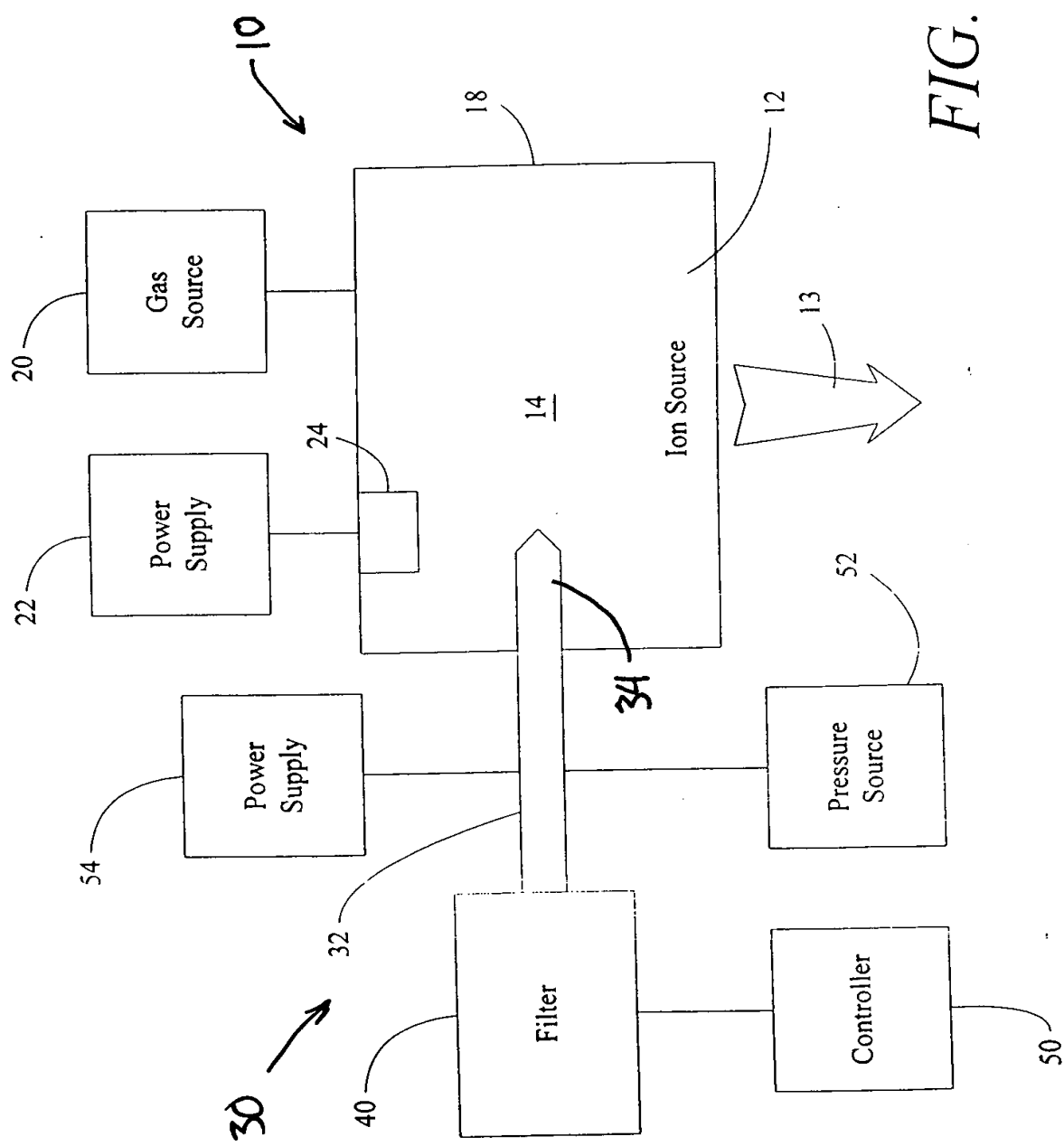


FIG. 1